

accordance with regulatory requirements and as specified in the TCEQ permits. The testing may include: 1) radioactive tracer surveys to confirm bottom-hole cement integrity; 2) annulus pressure tests to confirm integrity of the long string casing, injection tubing, and injection packer; 3) temperature or noise logging to test for potential movement along the borehole; and 4) casing inspection logs to test for corrosion.

Annulus pressure testing is performed by isolating the annulus pressure reserve tank and monitoring the fluid-filled annulus pressure over a specified period of time to check for any annulus leaks. The annulus continuous monitoring records are available for review by regulatory representatives to verify mechanical integrity of the annular space. The annulus is continuously monitored from a pressure transducer at the wellhead and recorded in the control room. If the annulus pressure approaches operating limits, an alarm will sound and action will be taken by an operator to maintain the pressure within operating limits.

The most recent mechanical integrity testing (MIT) and ambient pressure monitoring events for WDW-163, WDW-164, and WDW-165 were performed from April 15-18, 2008, and results reported to the TCEQ in a report submitted on May 18, 2008 titled "2008 Annual Mechanical Integrity and Reservoir Pressure Testing for WDW-163, WDW-164, and WDW-165". A copy of the test results are included in Appendix J. As of the date of the latest testing, the three Ineos injection wells successfully demonstrated mechanical integrity and reservoir pressures were within the limits modeled in the approved 1994 Petition demonstration.

5.4 Ambient Pressure Monitoring

Monitoring of the pressure buildups in the Ineos Injection Intervals is performed annually by conducting a pressure fall-off test in WDW-163, WDW-164, and WDW-165. This reservoir testing consists of a shut in of each well for a period of time sufficient to conduct a valid observation of the pressure fall-off curve. Data that are recorded include

the flowing pressure, the fall-off pressure curve, and the final static pressure. From these data, the hydrologic parameters and capacities of the reservoirs can be evaluated.

The latest pressure fall-off test conducted in WDW-163, WDW-164, and WDW-165 occurred in April 2008. The injection/fall-off test pressures and static bottom-hole pressures were as follows, plus the initial (1981 and 1983) static bottom-hole values:

Well Test Data	WDW-163
2008 Maximum Test Measured Flowing Bottom-hole Pressure (psia) at 5,400 feet Gauge Datum (KB)	2,572
2008 Static Bottom-hole Pressure at 5,400 feet KB (psia) after injection at 142 gpm and 20 hrs shut in	2,152
1983 Static Bottom-hole Pressure (psia) at 5,464 feet Gauge Datum (KB)	2,190

Well Test Data	WDW-164
2008 Maximum Test Measured Flowing Bottom-hole Pressure (psia) at 7,475 feet Gauge Datum (KB)	3,431
2008 Static Bottom-hole Pressure at 7,475 feet KB (psia) after injection at 210 gpm and 14 hrs shut in	3,023
1981 Static Bottom-hole Pressure (psia) at 7,614 feet Gauge Datum (KB)	3,175

Well Test Data	WDW-165
2008 Maximum Test Measured Flowing Bottom-hole Pressure (psia) at 6,770 feet Gauge Datum (KB)	3,596
2008 Static Bottom-hole Pressure at 6,770 feet KB (psia) after injection at 172 gpm and 20 hrs shut in	2,723
1981 Static Bottom-hole Pressure (psia) at 6,960 feet Gauge Datum (KB)	2,881

The results of the 2008 ambient pressure monitoring and fall-off testing indicate that the static bottom-hole pressure measured during the 2008 injection testing of WDW-163, WDW-164, and WDW-165 (when corrected to equivalent reference datums) are 2 psi higher (WDW-163), 1 psi lower (WDW-164), and 18 psi lower (WDW-165) than the pressures which was measured during the May 2007 reservoir testing. The results of the historical fall-off testing of the three wells are discussed in more detail in Section 7.3.21 and shown in Table 7-5.

A comparison of the predicted SWIFT model flowing bottom-hole pressures (from the 1994 Petition Re-issuance document) and April 2008 injection/fall-off test pressures follows:

Well Test Data	WDW-163
2008 Maximum Test Measured Flowing Bottom-hole Pressure (psia) Corrected to Petition Reference Depth	2,601
ΔP skin, (psi)	395
2008 Maximum Test Measured Flowing Bottom-hole Pressure (psia) ⁽¹⁾ after removal of skin	2,206
Petition Predicted Maximum Flowing Bottom-hole Pressure at Petition Reference Depth (psia) ⁽²⁾ at 4/08	2,292
Difference Between Petition Predicted and 4/08 Maximum Flowing Bottom-hole Pressure (psia) ⁽²⁾	86
Petition Reference Depth (ft)	5,464

- (1) Flowing pressure, no skin. ΔP skin determined using Trans II computer software.
(2) Flowing pressure, no skin

Well Test Data	WDW-164
2008 Maximum Test Measured Flowing Bottom-hole Pressure (psia) Corrected to Petition Reference Depth	3,494
ΔP skin, (psi)	330
2008 Maximum Test Measured Flowing Bottom-hole Pressure (psia) ⁽¹⁾ after removal of skin	3,164
Petition Predicted Maximum Flowing Bottom-hole Pressure at Petition Reference Depth (psia) ⁽²⁾ at 4/08	3,875
Difference Between Petition Predicted and 4/08 Maximum Flowing Bottom-hole Pressure (psia) ⁽²⁾	711
Petition Reference Depth (ft)	7,614

- (1) Flowing pressure, no skin. ΔP skin determined using Trans II computer software.
(2) Flowing pressure, no skin

Well Test Data	WDW-165
2008 Maximum Test Measured Flowing Bottom-hole Pressure (psia) Corrected to Petition Reference Depth	3,682
ΔP skin, (psi)	759
2008 Maximum Test Measured Flowing Bottom-hole Pressure (psia) ⁽¹⁾ after removal of skin	2,923
Petition Predicted Maximum Flowing Bottom-hole Pressure at Petition Reference Depth (psia) ⁽²⁾ at 4/08	3,575
Difference Between Petition Predicted and 4/08 Maximum Flowing Bottom-hole Pressure (psia) ⁽²⁾	652
Petition Reference Depth (ft)	6,960

- (1) Flowing pressure, no skin. ΔP skin determined using Trans II computer software.
(2) Flowing pressure, no skin

The results of the ambient pressure monitoring and fall-off testing indicate that the April 2008 maximum flowing bottom-hole pressures measured during the injection testing of the three Ineos injection wells are substantially below (86 psi—WDW-163; 711 psi—WDW-164; 652 psi—WDW-165) those pressures that were predicted to occur by the 1994 SWIFT pressure buildup models at those wells locations. The 2008 tests also indicate skin factors of +159, +37, and +57 respectively, which are indicative of near-wellbore reservoir damage. In addition, the new Petition re-issuance modeling (see Section 7.3.21) also predict higher flowing pressure values than measured in the April 2008 reservoir testing.